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(71) Applicant: FRATELLI BABBINI & C. sas  
Località Belchiaro  
I-47012 Civitella di Romagna (Forlì)(IT)

(72) Inventor: Babbini, Lionello  
F.lli Babbini & C. sas  
Loc. Belchiaro Civitella (Forlì)(IT)

(74) Representative: Sassatelli, Franco T., Dr.  
c/o INIP via Ruggi 5  
I-40137 Bologna(IT)

(54) Dehydrating screw press with two or more helical elements with intermeshing profiles.

(57) A dehydrating screw press by which an advancing product to be deshydrated is pressed, by the rotating movement of one or more screw elements with a conical shaft (1) and a conical spiral (2) operating in a corresponding space up to the wall of a filtering cage (3). As the increasing diameter of the spiral (2) conforms to the like reduction of the shaft section (4), the use of the helical elements fitted side by side allows each spiral to operate with a profile extending up to the other helical element wall. Therefore, non-intermeshing zones are avoided during the dehydrating phase in the intermediate space. As the two pressing elements are rotated in opposite directions, rotation of the pressed material is avoided, thus advancing the product in an axial direction. The filtering cage used for a press with two helical elements shows a conformity with two components (5 and 6) interconnected on lines (7 and 8) at the intermeshing area of the two spirals.

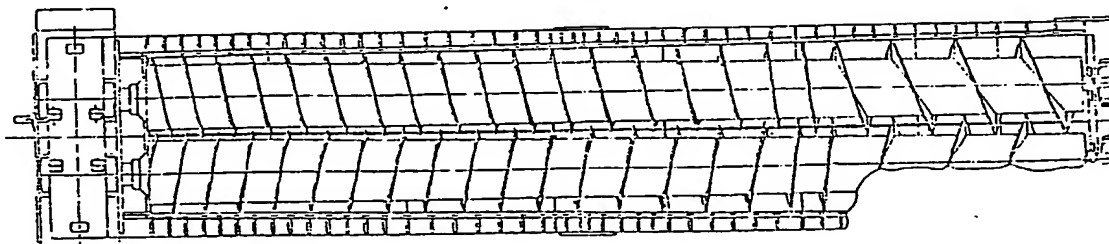


FIG. 2

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**Deshhydrating screw press with two or more helical elements with constant profile, working in a filtering cage according to their interference space.**

The invention refers to a deshydrating screw press with two or more helical elements, which avoids partial interference zones of the spirals on the product to treat. By using the above mentioned elements side by side, a combined effect of complete conical interference is obtained, in the interspace between shafts, with a push of the two intersecting spirals, with movement in opposition, which compels the axial advancement of the product.

The screw presses are used to deshydrate fibrous materials containing liquid; they are particularly used in the sugar beat treatment, in fodder deshydratation, to extract oils and produce meals for fodders from food stuff recovers such as fish and other. The said presses use two or more helical elements which let the product advance from an end, pressing it inside a filtering cage from which the liquid gets out steadily, while the anhydrous residue is discharged from the other end. The present presses use helical elements with two different diameters and with a fitting in a truncated cone shape between these elements. This causes a bicylindrical interference space of the spiral filtering cage, which gives rise to non-interference zones, as well as other zones with limited interference of the spirals. This intervention difformity and even of non-intervention of the spiral does not grant a uniformity of pressure of the product and causes losses of delivery. In particularly, when the helical elements are used side by side, zones of limited and even of no interference of the spirals occur, where difficulties can be noted in letting the product advance. Consequently, this one tends to stagnate and in particular, owing to the lateral over-stressing caused by the spirals in these zones, heaping may occur with relevant heavy problems. Moreover the difform advancement of the product causes void spaces which crush and damage the anhydrous residue. Therefore, one can affirm that the speed allowed by the installation cannot be completely made most of, because it must be steadily in conformity with the product to treat and production must steadily be checked to enable timely intervention.

These inconveniences are obviated by the present invention which ensures uniformity in the pressing action of the helical element spiral that is steadily operating with space interference to wall limit. In the interspace between the shafts of the helical elements fitted side by side, the system allows the combined effect of complete interference with push of the intersecting parts of the in opposition turning spirals which compels the axial

forward move of the product. In connection, since there are no zones without or with limited interference, the system enables to adjust the delivery to the speed of the propellers. In particular, the smaller space existing in the central intermediate part between the two helical elements, carried out according to the invention, in comparison with the one existing in the already mentioned union with truncated-cone interference, avoids heap-of product; on the contrary, since the two intersecting spirals operate with complete interference up to the wall limit of the two shafts, the gradual axial move of the product is ensured.

Substantially, the product to deshydrate in advancing movement is pressed by the rotating motion of two or more screw elements with conical shaft 1 and also conical spiral 2 - total and regular - to operate in a correspondence space to wall limit of the filtering cage 3. If the helical elements with regular total conical interference are used side by side, since the lifting upwards of the spiral 2 is in them in accordance with a like section reduction 4 of its shaft 1, each spiral is allowed to work with profile continuity up to wall limit of the shaft of the other helical element, thus avoiding zones of either no or limited interference on the treated product in the intermediate space between the shafts. Moreover, the movement in opposition of the two or more pressing elements causes a combined effect of complete interference given by the two reciprocally intersecting spirals which compels the axial advancing motion of the product. The filtering cage used for the press with two or more helical elements consists of two components 5 and 6 connected on slanting converging lines 7 and 8 fitted on interference limit of the two or more intersected spirals.

An execution version of a deshydrating press, with two helical elements fitted side by side, is illustrated in the schematic drawings of table 1. With reference to this table, fig. 1 is the vertical longitudinal section of the press with side view of a helical element to point out the conical interference spiral which operates up to wall limit of the filtering cage. Fig. 2 is a partial view of horizontal longitudinal section of the press, with view from above of the two flanked helical elements to show the intermediate zone between the two shafts where the interference of the two spirals can be noted, each one of which is working up to wall limit of the other one's shaft. Fig 3 is a view of the press transversal section to show the interference fields of the two spirals.

For the press operation, motor 9 is started

which, by means of transmission 10 with pulleys 11 and 12, transmits the movements, through reducer 13 on shafts 14, to the helical elements with conical shafts 1 and conical spirals 2. The biconical filtering cage is kept, by the modular grouping U-bolts 15 and 16, in the frame 17 on base 18 and is contained in carter 19 complete with inspection lids 20.

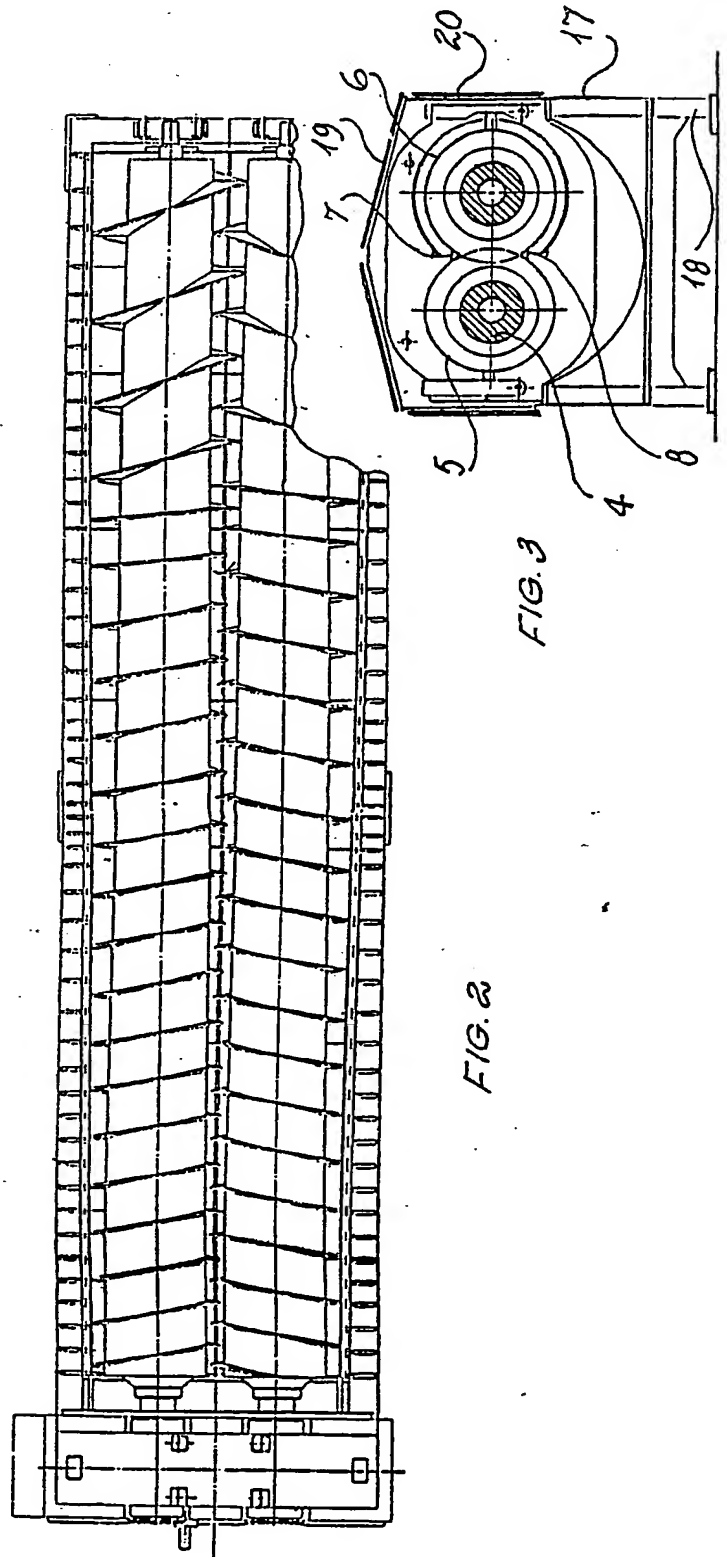
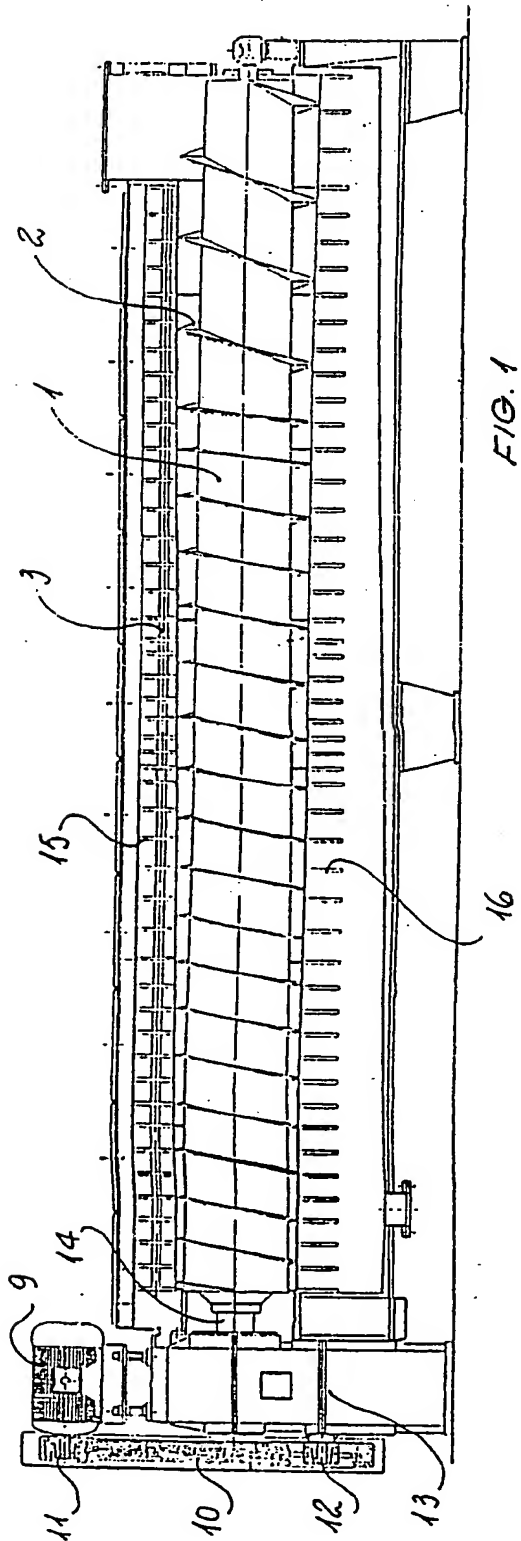
In the executions, the use of helical elements is foreseen with constant profile shafts and spirals. The components may fitted in different connections and replaced with other technically equivalent ones.

### Claims

1) Deshydrating screw press, characterized by the fact that the used helical elements with total and constant conical interference are fitted side by side, and since the lifting of the spiral (2) is in them in relation with the like reduction of the shaft (1) section (4), each spiral is allowed to operate with profile continuity up to wall limit of the shafts of the other helical conical elements. In this way, the presence of zones with no or limited interference on the treated product is avoided. Moreover, the movement in opposition of the two or more pressing elements causes a combined push antiturning intervention given by the two or more intersecting conical spirals with constrains the axial forward movement of the product.

2) Deshydrating screw press, as per claim 1, characterized by the fact that the filtering cage used for a press with two or more helical elements, consists of two of more components (5 and 6) connected on converging slanting lines (7 and 8) at interference limit of the two intersected spirals.

3) Deshydrating screw press, as per claim 1, characterized by the fact that the pressing of the product to dehydrate during advancing is performed by the rotating movement of either one or more screw elements with conical shaft (1) and conical spiral (2) with total constant conical interference in order to operate in space of correspondence at wall limit of biconical filtering cage (3).





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# EUROPEAN SEARCH REPORT

Application Number

EP 88 83 0372

| DOCUMENTS CONSIDERED TO BE RELEVANT  |   |  |   |
|--|---|--|---|
| Category   | Citation of document with indication, where appropriate, of relevant passages             | Relevant to claim                              | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
| X  | GB-A- 677 794 (HARTNER)<br>* Page 1, lines 66-84; claims 1-3;<br>figure 1 *<br>---        | 1-3  | B 30 B 9/16                                   |
| X  | US-A-2 567 219 (LESNIAK)<br>* Column 5, line 73 - column 7, line<br>10; figure 2 *<br>--- | 1-3  |   |
| X  | GB-A-1 140 237 (STORD BARTZ INDUSTRI)<br>* Whole document *<br>---                        | 1-3  |   |
| A  | GB-A- 904 328 (STORD MARIN INDUSTRI)<br>* Claims 1,2; figures 1,2 *<br>---                | 1-3  |   |
| A  | DE-C- 883 338 (COLOMBO & CO.)<br>* Whole document *<br>-----                              | 1-3  |   |
|  |   |  | TECHNICAL FIELDS<br>SEARCHED (Int. Cl.4)      |
|  |   |  | B 30 B  |
| The present search report has been drawn up for all claims   |   |  |   |
| Place of search<br>THE HAGUE   |   | Date of completion of the search<br>10-05-1989 | Examiner<br>BOLLEN J.A.G.                     |
| <b>CATEGORY OF CITED DOCUMENTS</b><br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>-----<br>& : member of the same patent family, corresponding document |   |  |   |

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